US006978964B2

(12) **United States Patent**
Beccari

(10) **Patent No.: US 6,978,964 B2**
(45) **Date of Patent: Dec. 27, 2005**

(54) **APPARATUS FOR SUPPLYING A RIBBON-LIKE MATERIAL TO ONE OR MORE WORK MACHINES AND COMPONENT PARTS OF SAID APPARATUS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 35 days.

(21) Appl. No.: **10/250,443**

(22) PCT Filed: **Dec. 19, 2001**

(86) PCT No.: **PCT/IB01/02607**

§ 371 (c)(1),
(2), (4) Date: **Jul. 1, 2003**

(87) PCT Pub. No.: **WO02/057165**

PCT Pub. Date: **Jul. 25, 2002**

(65) **Prior Publication Data**

US 2004/0041056 A1 Mar. 4, 2004

(30) **Foreign Application Priority Data**

Jan. 19, 2001 (IT) BO2001A0018

(51) **Int. Cl.**[7] **B65H 19/12**; B65G 1/127
(52) **U.S. Cl.** **242/559**; 414/277
(58) **Field of Search** 242/559, 559.1, 242/559.3, 559.4, 560, 564.5; 414/277, 279, 414/283, 911

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(57) **ABSTRACT**

Apparatus for supplying a ribbon-like material or fabric to one or more machines for cutting the material, comprising a reel storage having a plurality of housings for storing a respective reel, elements for supplying the material to a respective machine, elements for drawing a respective reel of the ribbon-like material. Control elements are provided to command the gripping of a real, by the drawing elements, from the predefined housing and the delivery of this reel to the elements for delivering the material of a respective work machine and, vice versa, to command, by the drawing elements, the gripping of the reel, partially or totally used in the machine, by the elements for supplying the material, and the release of this reel to the corresponding housing in the storage.

29 Claims, 3 Drawing Sheets

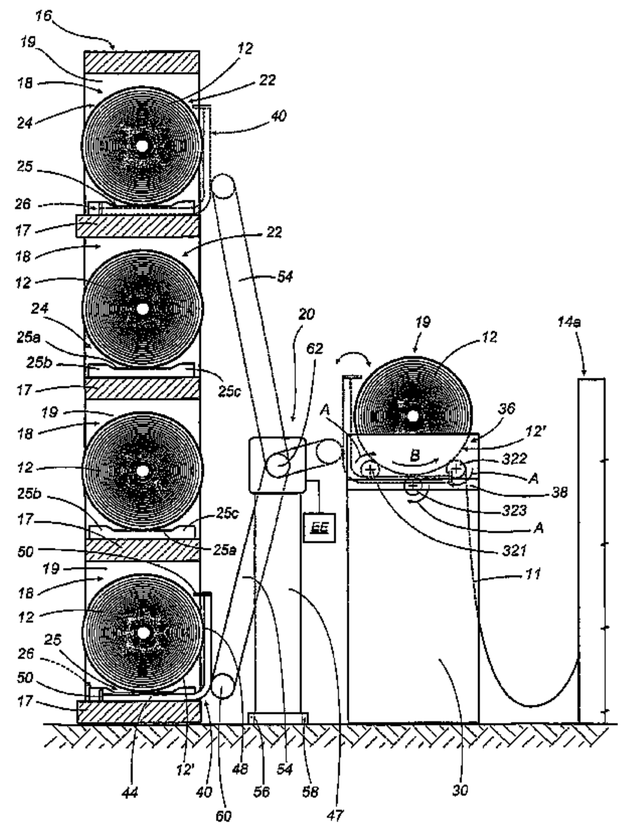

FIG. 1

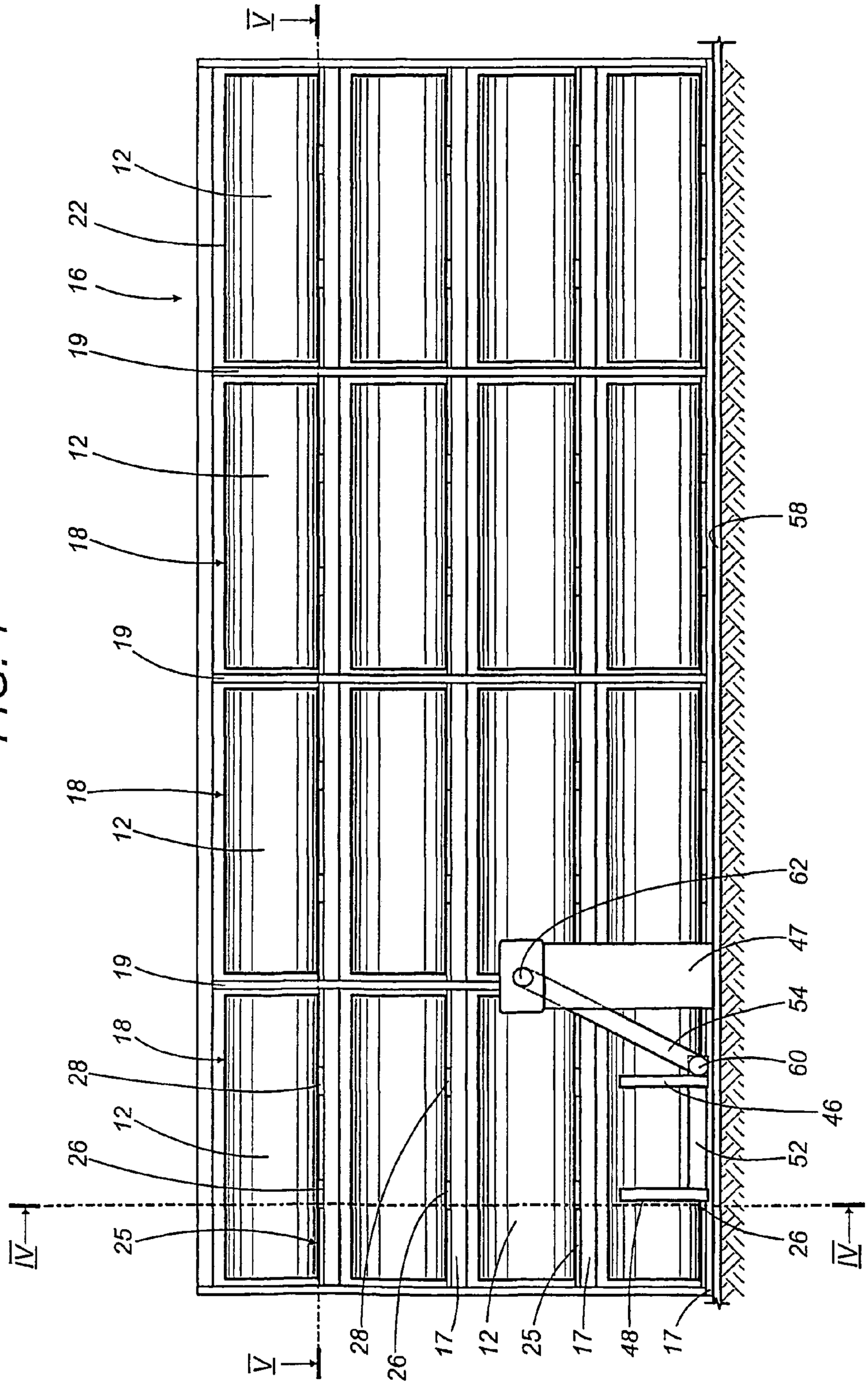
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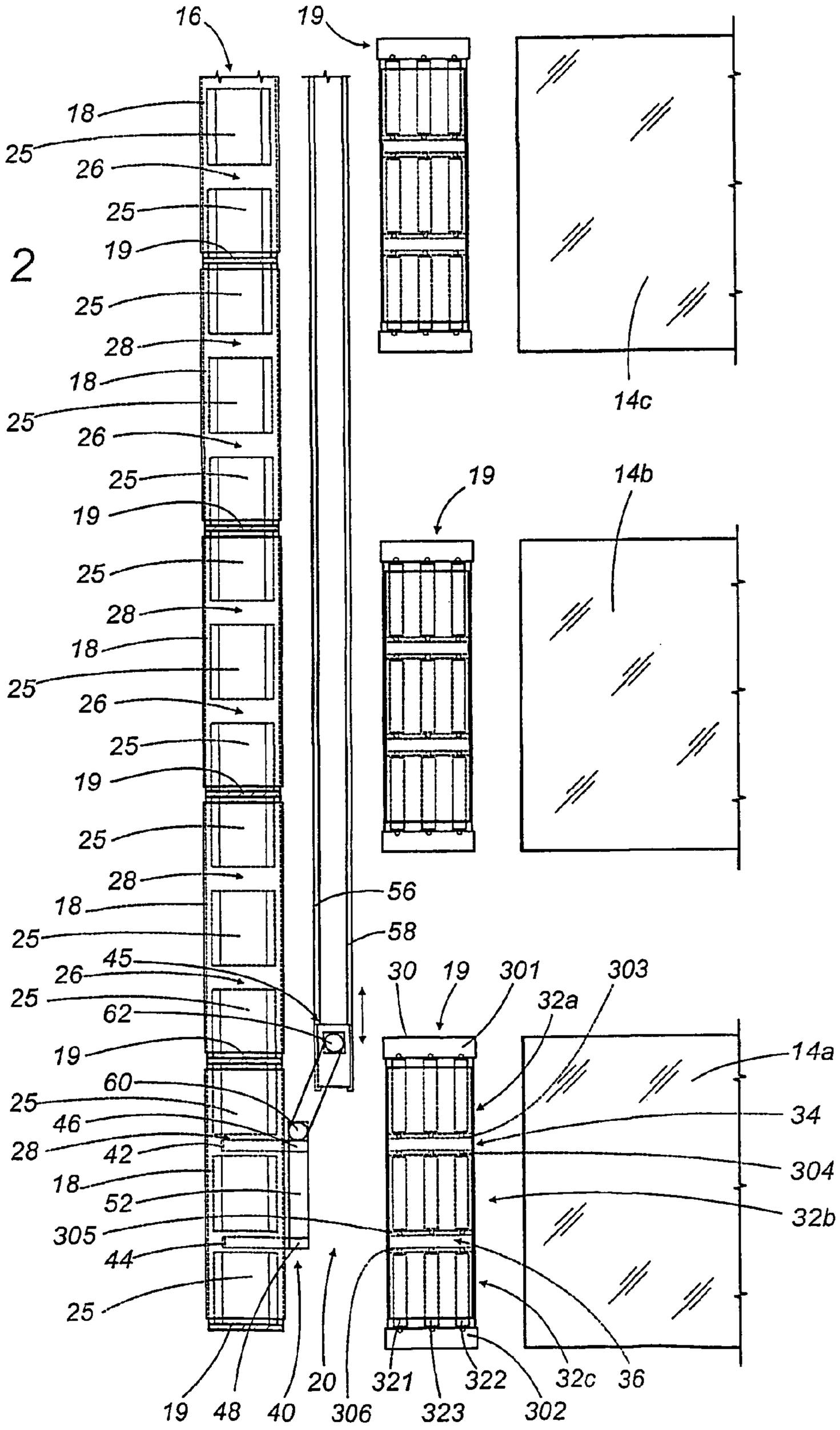
FIG. 2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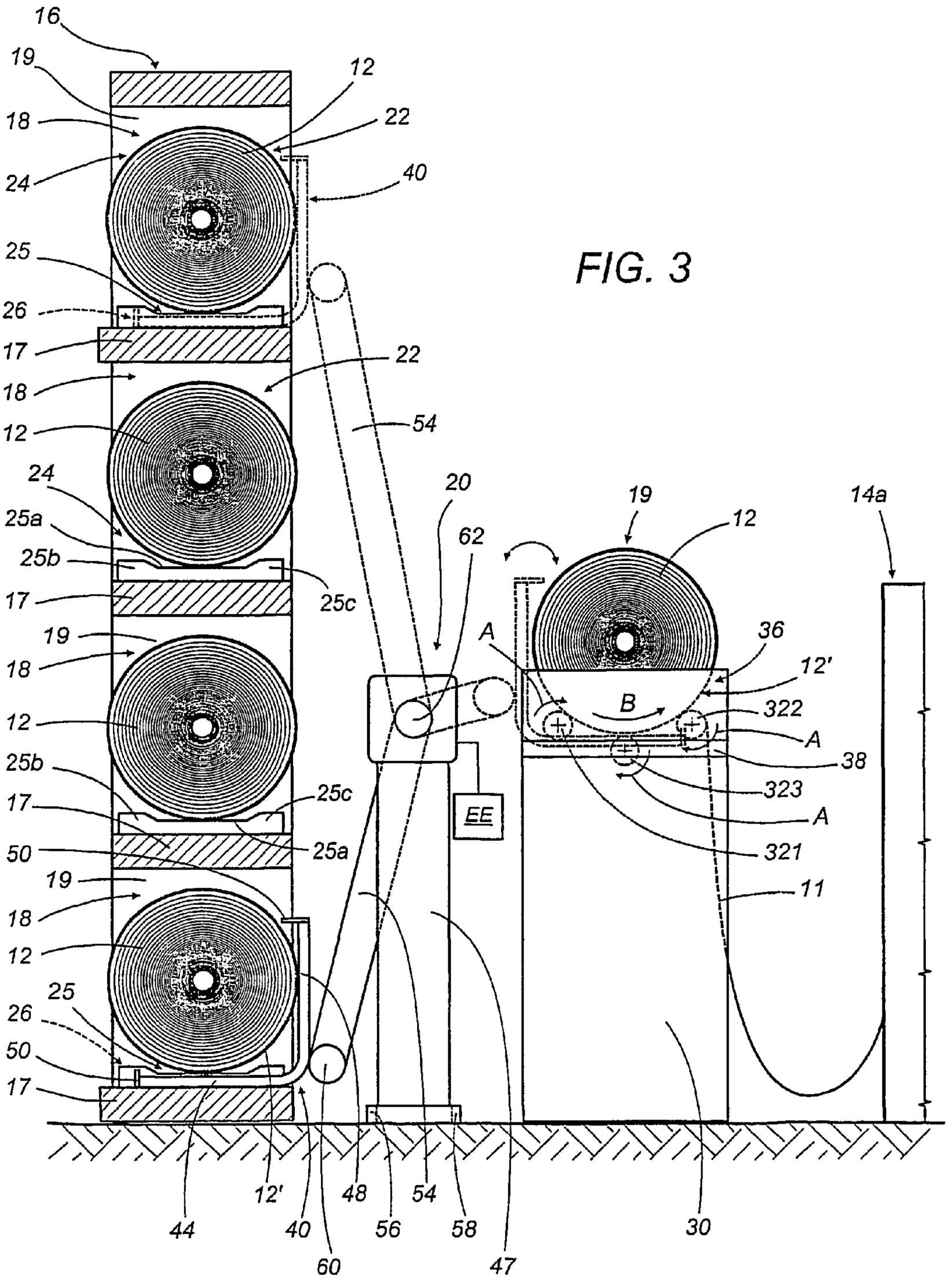
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A
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12'
18
B
322
12
A
25b
38
323
25c
17
A
50
25a
321
19
11
18
12
25
26
50
17
12'
48
54
44
40
56
58
30
60
47

FIG. 3

APPARATUS FOR SUPPLYING A RIBBON-LIKE MATERIAL TO ONE OR MORE WORK MACHINES AND COMPONENT PARTS OF SAID APPARATUS

TECHNICAL FIELD

The present invention relates to an apparatus for supplying a ribbon-like material, in particular a fabric or the like, to one or more machines for working said material.

BACKGROUND ART

In the field related to the cutting of pieces or patches of fabric, or similar material, into appropriately shaped portions, in particular for manufacturing suits or other clothing items, cutting machines are used which have a jigsaw that simultaneously operates on a certain quantity of superposed layers (numbering a few tens, for instance 40–50 layers), which are stacked on a bristle support and held there by means of a vacuum appropriately applied from the side of said bristle support.

To feed the fabric to be cut to said prior art machines, in manufacturing plants appropriate folding apparatuses are employed, which unroll the ribbon-like material from a respective reel arranging it in zigzag fashion, in such a way as to define a plurality of superposed layers, which must then be transferred, for their simultaneous cut, on the bristle cutting plane of known machines.

In practice, according to the procedure for supplying or feeding the ribbon-like material which is the basis for the operation of said known manufacturing plants, the ribbon-like material, which is supported by a single reel, is completely unrolled. For such prior art machines, it is neither envisaged nor economically practical to use the ribbon-like material of a respective reel only partially, in view of cutting fabric portions destined to the manufacture of a limited number of clothing items.

With prior art machines, therefore, there is a tendency to produce an excessive number of fabric cuts for an overabundant number of clothing items, which risk remaining unsold with the deriving economic losses for the manufacturing companies; conversely, if demand is only limited to a small number of said clothing items, it is preferred to forego such production runs, with the deriving loss of the work order and related revenues.

In prior art plants, moreover, said folding apparatuses are complex, costly, and with an insufficient operating rate, which entails excessive delays in the supply to the cutting machines downstream of the folding machines. The entire production cycle of the plant is thus slowed down.

A further drawback that is present in prior art systems concerns the way in which the reels are positioned in the unrolling station associated to the folding device. The reels supporting the ribbon-like material must be kept raised by pincers or the like, which engage the end parts of the reel and/or of the support core, to allow the insertion of a respective support shaft of the unrolling station, which is inserted into the central hole provided in the support core of the reel Said core for supporting the ribbon-like material of the reel is made of cardboard, which is easily deformed by flexing and is of poor quality, which makes it performing such loading operations at the unrolling station difficult and awkward. In extreme cases, when the ribbon-like fabric is particularly delicate, the execution of such operations could even cause damage to said product.

DISCLOSURE OF THE INVENTION

As set out in claim **1**, in accordance with the present invention an apparatus is provided for supplying a ribbon-like material, in particular a fabric or the like, to one or more machines for working said material, in particular one or more machines for cutting the material into appropriately shaped portions, said apparatus comprises a storage bay having a plurality of predefined storage housings for a respective support reel of a respective ribbon-like material, means for supplying the material to the respective machine, means for drawing a respective reel, and control means able to command said drawing means to take a reel from a predefined housing and deliver it to said means for supplying the material of a respective work machine and, vice versa, to command said drawing means to take the partially or totally used reel from said means for supplying the material and deliver said reel to the corresponding housing the aforesaid storage bay.

In this way, the operation of supplying the material to the machine is made extremely flexible as a function of the specific requirements of each individual production run. With the present system or apparatus it is possible automatically to feed, to the downstream work machines, any quantity of material, even a limited quantity.

The supply of material to the downstream work machines is, thanks to the present apparatus, made extremely faster, overcoming to the maximum extent the considerable idle times which are instead present in prior art plants.

Moreover, it is possible, without the need for any intervention by personnel, to supply to a machine the reel of the material having the characteristics, for instance colour, quality and type of fabric, required for the current work process. All that is needed is automatically to draw the reel of desired material, housed inside a predefined housing, from the storage bay.

The secondary claims describe other advantageous aspects of the invention.

The present invention further relates to the individual component parts of this apparatus, such as a reel storage bay, a device for supplying the material to a respective work machine, a device for drawing a reel and an organ for gripping said reel.

DESCRIPTION OF THE DRAWINGS

The invention, in its technical characteristics and in its different advantageous aspects, shall become more readily apparent from the detailed description that follows, made with reference to the accompanying drawings, which represent an embodiment provided purely by way of non limiting example, in which:

FIG. **1** is a front view showing the reel storage bay and the drawing and transferring robot of an apparatus according to a preferred embodiment of the present invention;

FIG. **2** shows a horizontal section view, taken according to the line V—V of FIG. **1**, of the preferred embodiment of apparatus of the present invention;

FIG. **3** shows a longitudinal section view, taken according to the line IV—IV of FIG. **1**, of the preferred embodiment of apparatus of the present invention.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

The present apparatus is preferably used upstream of machines for cutting fabric of the kind described in Inter-

national Patent Application no. PCT/IB00/01781, of the same Applicant and whose content shall be deemed as an integral part of the present description.

With reference to FIGS. **1**, **2** and **3** of the accompanying drawings, a preferred embodiment is illustrated hereafter of an apparatus for supplying a reel of material **12**, in particular a reel of fabric or the like, to one or more machines working said material, indicated in schematic fashion and marked with the numeric references **14***a*, **14***b*, **14***c* in the aforementioned figures.

The present apparatus comprises a reel storage bay **16** having a plurality of storage housings **18** for a respective reel **12** and it has a structure extending transversely to the work machines **14***a*, **14***b*, **14***c*, which defines a plurality of horizontal planes **17** which are subdivided, by vertical walls **19**, into housing compartments **18** for respective reels **14**.

In practice, each compartment or housing **18** has a predefined position (determined for example by its spatial coordinates with respect to one or more reference points) and in each of them is positioned a reel of material having predefined characteristics.

As can be observed with particular reference to FIGS. **1** and **2**, the housings **18** for the reels **12** have a support base **25** for the reel **12** and at least a first and a second slits **26**, **28** for the insertion of the tines **42**, **44** of a fork **40** for drawing the reel—which shall be better described farther on—which slits open superiorly to allow the lifting of the aforesaid reel.

As it is particularly evident in FIG. **3**, said support base **25** has a substantially horizontal support surface **25***a* for the reel **12** and a first and a second end longitudinal projections **25***b*, **25***c* which extend to a higher level of the aforesaid support plane for retaining said reel within said housing.

Said base **25** is particularly advantageous because it allows easily to draw the reel and provides it with such a support as to eliminate any flexural deformation, which would risk, especially in case of prolonged stationing of the reel on the support plane, to damage the supported fabric.

The present apparatus further comprises means **19** for supporting, unrolling and supplying the material to the respective machine **14***a*, **14***b*, **14***c*.

Said device or means **19** for supporting, unrolling and supplying the material to the respective machine **14***a*, **14***b*, **14***c* is in the form of rotating roller means suitable for supporting and unrolling the material of the reel **12**.

Said roller means are supported on an appropriate support frame **30** and comprise a plurality of sections set transversely side by side **32***a*, **32***b*, **32***c*, which are such as to define at least a first and a second insertion passage **34**, **36** for the tines of a fork for drawing the reel **12**, which are open superiorly to allow, as shall be described better farther on, the lifting of said reel.

In particular, each section **32***a*, **32***b*, **32***c* of said rollers comprises at least a first and a second longitudinally distanced rollers **321**, **322**, situated at the same level or height, whereon the reel **12** is set with its outer surface **12'**.

Each section **32***a*, **32***b*, **32***c* of said rollers further comprises a third roller **323** placed in an intermediate longitudinal position relative to said first and second roller **321**,**322**, and situated at a lower level than them, to define an additional support point for the outer surface **12'** of the reel, such as to obtain a sort of "cradle" configuration to support the outer surface of said reel.

To provide for the unrolling rotation of said reel, said rollers **321**, **322**, **322** are made to rotate as shown by the arrows A of FIG. **3**, commanded by appropriate motor actuation means, which are not particularly shown in the accompanying figures and which are anyway known by the person versed in the art.

As particularly shown in FIG. **2**, the rollers **321**, **322**, **323** of said sections of rollers **32***a*, **32***b*, **32***c* are supported in rotary fashion by means of the lateral vertical walls **301**, **302** and intermediate walls **303**, **304**, **305**, **306** of said frame **30**, in such a way that said passages for the tines of the fork are defined between respective intermediate walls **303**, **304**, **305**, **306**, which further define means able laterally to guide said tines of the fork during their introduction into said passages **34**, **36**.

A horizontal transverse plane **38** inferiorly delimits said passages **34**, **35** defining lower guidance means for said tines of the drawing fork.

The present apparatus also has means **20** for drawing, transferring and releasing a respective reel **12**.

Said means or device **20** for drawing a respective reel **12** comprise an organ **40** for gripping or drawing the reel having at least a first and a second mutually parallel tines **42**, **44**. In this way, it is possible to support the reels in correspondence with intermediate points, reducing the flexural deformation effect that risks damaging the product and renders reel actuation operations awkward.

The gripping or drawing organ **40** further comprises a second pair of tines **46**, **48** extending mutually parallel and substantially orthogonal to said first and second tines **42**, **44**. As shall be better described farther on, such a structure of the fork **40** allows the execution of an effective upsetting of the fork.

As shown, each of said tines **42**, **44**, **46**, **48** ends with a portion **50**, projecting perpendicularly relative to the tine, able to allow the retaining of said reel **12**, especially on the occasion of the upsetting of fork **40**, as shall be described better farther on.

As shown especially in FIG. **2**, said fork **40** for gripping the reel further comprises a cross member **52** supporting said tines **42**, **44**, **46**, **48**.

The means **20** for drawing, transferring and releasing a respective reel **12** further comprise a movable assembly **45** having support means for said organ **40** for gripping the reel, which are, as shown in the figures, in the form of a movable arm **54**.

Preferably said movable assembly **45** is in the form of an "anthropomorphic" robot having a column body **47** able to slide on guiding tracks **56**, **58** extending parallel to the front face of said storage bay **16**.

Said movable assembly is commanded to move along the tracks through appropriate actuating means (not shown in the accompanying figures and anyway well known to the person versed in the art).

As shown, said guiding tracks **56**, **58** extend, advantageously from the point of view of bulk, between said storage bay **16** and said means for supplying the material to the working machines **14***a*, **14***b*, **14***c*.

Advantageous means are provided to cause the fork **40** to rotate by at least 90° in the two opposite angular directions, in order to obtain the upsetting of said fork **40**. The arm means **54** for supporting and actuating the fork **40** comprise, for this purpose, a joint **60** able to make said fork **40** effect said rotation of at least 90°, in the two opposite angular directions. In this way it is possible, by performing a simple operation of upsetting the fork **40**, to present the reel immediately to said supplying and unrolling roller means **19** or to said housing storage bay **16**.

The arm **54** is, in turn, connected to the body of said movable assembly by means of a ball joint **62** which allows

a three-dimensional rotation of said arm **54**, in order to allow the attainment of any desired position of said means **40** for gripping or drawing the reel.

Appropriate means for actuating the arm **54** and rotating the fork **40** are provided, however they are not expressly shown in the figures as they are known to the person versed in the art.

The present apparatus, i.e. the robot **20** further comprises appropriate control means EE, schematically indicated in FIG. **3**, which are able to command the gripping of a reel **12**, by said drawing means **20**, from a predefined housing **18** and the delivery to said means **19** for supporting, unrolling and supplying the material of a respective work machine **14***a*, **14***b*, **14***c*, and vice versa, to command the gripping of the reel, partially or totally used by the respective machine, by said means **19** for supporting, unrolling and supplying the material and the release of said reel **12** to the corresponding housing **18** in the aforesaid storage bay **16**.

Said control means are in the form of at least an electronic computer EE, having at least a memory, means for inputting/outputting the signals and/or data and a processor operating under the control of a computer programme, able to command said drawing means in accordance with a predefined work sequence.

In practice, said control means store in the memory the position, in a respective storage bay housing, of a determined reel having predefined characteristics, and, when the work sequence of the cutting machine requires it, they automatically go fetch said reel to provide it to the cutting machine that requires it. Once the material of this reel has been used, said drawing means are commanded by said work programme to take said reel from the respective unrolling device and return it to its predefined housing compartment.

In this way, one obtains the nearly full complete automation of the operation of supplying the material to the work machine, achieving a considerable saving in terms of manpower and production costs.

In this way, moreover, the operation of supplying the material to the machine is made extremely faster.

It is also possible, without the need for any intervention by personnel, to supply to a machine the reel of material having the characteristics, for instance colour, quality and type of fabric, that are required for the work processes in progress.

Furthermore, as can be noted in particular from FIG. **2**, said compartments **18**, advantageously, have a front opening **22**, defining a front access for drawing the reels **12**, and an opposite rear opening **24**, defining a rear access for loading a new reel **12** in the respective housing **18**.

In this way, the loading of fall reels and the unloading of empty reels can be performed easily, without hampering the operation of supplying the material to the work machines.

The operation of the present apparatus is, briefly, as follows. The reel of material **12**, positioned on said rollers **19**, is unrolled, by rolling, according to the arrow B, on said rollers thanks to the action that they impart to the exterior peripheral layer of the reel by effect of the respective actuation in rotation, progressively transferring the ribbon-like material to the cutting machine. A strip of said fabric which has been unrolled from the reel **12** and which is suspended between said reel and the machine **14***a* is indicated with the numeric reference **11** in FIG. **3**.

Once the cutting operation is completed in the respective machine downstream of the specific material or fabric of the reel being worked at that moment, the electronic computer EE commands the robot **20** to insert the tines **46**, **48** into the passages **34**, **36**, between the sections of the respective roller set **19**, and the subsequent lifting of said reel from said device **19**. Subsequently, still under the control of the aforesaid electronic computer EE, the fork **40** is upset by 90° and the robot **20** is commanded to move along the tracks **56**, **58** and the arm **54** is positioned at the appropriate height to insert the fork into the predefined compartment **18** for the transported reel. Once the robot has positioned the fork in the compartment **18**, with lowering motion, it sets the reel **12** down onto the upper surface of the base **25** and, inserting itself into the longitudinal slits **26**, **28** provided therein, disengages the fork of the reel **12**. The robot then extracts the fork **40** from the compartment **18**, leaving the reel set down on the support plane **25***a*.

At this point, the electronic processing means command the robot to go position itself in correspondence with a compartment **18** of an additional reel of material to be subjected to work process and to insert the tines **42**, **44** into the slits **34**, **36** of said additional compartment.

With a lifting motion of the fork it is possible to engage and delicately lift the new reel and to extract it from the compartment **18** with backwards motion, towards the work machines, in the longitudinal direction. By upsetting the fork by 90°, rotating the arm **54** and moving the robot longitudinally along the tracks it is possible to position the reel in correspondence with the roller "cradle" **19** of the corresponding machine and with lowering motion of the fork, with the insertion of the tines into the passages **34**, **36**, to release said reel to the roller set **19**.

The insertion of the piece **11** of the ribbon-like material of the reel to the machine can be effected manually by personnel.

The present apparatus enables to execute the operation of supplying the material to the cutting machines, even having very limited manoeuvring spaces available.

The invention thus conceived can be subject to numerous modifications and variations, without thereby departing from the scope of the inventive concept. Moreover, all components can be replaced with technically equivalent elements.

What is claimed is:

1. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (**14***a*, **14***b*, **14***c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (**16**) having a front end and a plurality of predefined housings (**18**) for storing a respective individual reel (**12**) supporting a respective ribbon-like material, said housings (**18**) comprising a plurality of housings (**18**) horizontally and vertically distributed, each housing having a front opening (**22**) for the drawing of the reels (**12**) which are on the same front side of the storage bay;

means (**19**) for supplying the material to the machine (**14***a*, **14***b*, **14***c*),

means (**20**) for drawing a respective reel (**12**) between the front side of the storage bay (**16**) and said means (**19**) for supplying the material to a respective machine; and control means (EE) able to command the gripping of a reel (**12**), by said drawing means (**20**), from a predefined housing (**18**)

and the delivery to said means (**19**) for delivering the material of a respective work machine (**14***a*, **14***b*, **14***c*) and,

vice versa, to command, by said drawing means (**20**), the gripping of the reel by the same means (**19**) for sup-

plying the ribbon-like material, and the release of said reel (**12**) to the corresponding housing (**18**) in said storage bay (**16**).

2. Apparatus as claimed in claim **1**, wherein said housings (**18**) have a front access for the drawing of the reels (**12**) and a rear access for the loading of a new reel (**12**) into the respective housing (**18**).

3. Apparatus as claimed in claim **1**, wherein said means (**20**) for drawing a respective reel (**12**) comprise an organ for gripping the reel (**40**) having at least a first and a second mutually parallel tines (**42**, **44**).

4. Apparatus as claimed in claim **3**, wherein said gripping organ (**40**) has a second pair of tines (**46**, **48**) extending parallel to each other and substantially orthogonal to said first and second tines (**42**, **44**).

5. Apparatus as claimed in claim **3**, wherein each of said tines (**42**, **44**, **46**, **48**) has a free end having a portion (**50**) that projects perpendicularly from the respective tine to retain said reel (**12**).

6. Apparatus as claimed in claim **1**, wherein said drawing means (**20**) comprise at least a movable assembly (**45**) having means (**54**) for supporting said organ (**40**) for gripping the reel.

7. Apparatus as claimed in claim **6**, wherein said support means for the gripping organ (**40**) are in the form of a movable arm (**54**).

8. Apparatus as claimed in claim **6**, wherein said movable assembly (**45**) is movable between said storage bay (**16**) and said means for supplying the material to the work machines (**14***a*, **14***b*, **14***c*).

9. Apparatus as claimed in claim **6**, wherein said movable assembly is actuated to move along guiding tracks (**56**, **58**) which extend parallel to the drawing face of said storage bay (**16**).

10. Apparatus as claimed in claim **1**, wherein said means (**20**) for drawing a respective reel (**12**) comprise an organ for gripping the reel (**40**) and means that are provided to impart a rotation, in the two opposite angular directions, to obtain the upsetting of said organ (**40**) for gripping the reel.

11. Apparatus as claimed in claim **1**, wherein said means (**19**) for supplying the material to the respective machine (**14***a*, **14***b*, **14***c*) are means for supporting and unrolling the material from the reel (**12**) in the form of roller means subdivided into a plurality of sections set transversely side by side (**32***a*, **32***b*, **32***c*) such as to define at least a first and a second passage (**34**, **36**) for the insertion of the tines of a fork for drawing the reel (**12**).

12. Apparatus as claimed in claim **11**, wherein each section (**32***a*, **32***b*, **32***c*) of said rollers comprises at least a first and a second longitudinally distanced roller (**321**, **322**), situated at the same level or height, whereon the reel (**12**) is laid down with its outer surface (**12'**).

13. Apparatus as claimed in claim **12**, wherein each section (**32***a*, **32***b*, **32***c*) of said rollers comprises a third roller (**323**) placed in intermediate longitudinal position relative to said first and second roller (**321**, **322**), and situated at a lower level relative thereto, to define a further bearing point for the substantially cylindrical outer surface (**12'**) of the reel (**12**).

14. Apparatus as claimed in claim **11**, wherein lateral guidance means for the tines of the organ for gripping the reel, when they are introduced into said insertion passages (**34**, **36**), are provided on said means (**19**) for supplying the material to the respective machine (**14***a*, **14***b*, **14***c*).

15. Apparatus as claimed in claim **11**, wherein the rollers (**321**, **322**, **323**) of said roller sections (**32***a*, **32***b*, **32***c*) are supported able to rotate by means of lateral vertical walls (**301**) and intermediate walls (**303**, **304**, **305**, **306**) of said frame (**30**) in such a way that said passages (**34**, **36**) for the tines of the fork are defined between respective intermediate walls (**303**, **304**, **305**, **306**), providing said lateral guidance means for the tines of the reel grip organ which are introduced into said passages (**34**, **36**).

16. Apparatus as claimed in claim **1**, wherein said housings (**18**) have a bearing base (**25**) for the reel (**12**) and at least a first and a second slit (**26**, **28**) for the insertion of the tines (**42**, **44**) of a fork (**40**) for drawing the reel (**12**).

17. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (**14***a*, **14***b*, **14***c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (**16**) having a plurality of predefined housings (**18**) for storing a respective individual reel (**12**) supporting a respective ribbon-like material,

means (**19**) for, supplying the material to the machine (**14***a*, **14***b*, **14***c*),

means (**20**) for drawing a respective reel (**12**); and

control means (EE) able to command the gripping of a reel (**12**), by said drawing means (**20**), from a predefined housing (**18**)

and the delivery to said means (**19**) for delivering the material of a respective work machine (**14***a*, **14***b*, **14***c*) and,

vice versa, to command, by said drawing means (**20**), the gripping of the reel by said means (**19**) for supplying the ribbon-like material, and the release of said reel (**12**) to the corresponding housing (**18**) in said storage bay (**16**);

wherein the housings (**18**) have a front access for the drawing of the reels (**12**) and a rear access for the loading of a new reel (**12**) into the respective housing (**18**).

18. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (**14***a*, **14***b*, **14***c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (**16**) having a plurality of predefined housings (**18**) for storing a respective individual reel (**12**) supporting a respective ribbon-like material,

means (**19**) for supplying the material to the machine (**14***a*, **14***b*, **14***c*),

means (**20**) for drawing a respective reel (**12**); and

control means (EE) able to command the gripping of a reel (**12**), by said drawing means (**20**), from a predefined housing (**18**)

and the delivery to said means (**19**) for delivering the material of a respective work machine (**14***a*, **14***b*, **14***c*) and,

vice versa, to command, by said drawing means (**20**), the gripping of the reel by said means (**19**) for supplying the ribbon-like material, and the release of said reel (**12**) to the corresponding housing (**18**) in said storage bay (**16**);

wherein said means (**20**) for drawing a respective reel (**12**) comprise an organ for gripping the reel (**40**) having at least a first pair of tines (**42**, **44**) extending parallel to each other and a second pair of tines (**46**, **48**) extending parallel to each other and substantially orthogonal to said first pair of tines (**42**, **44**), said first and second pair of tines adapted to support from underneath the reel, respectively, in a position of drawing from and releasing to the respective housing and in a position of releasing to and drawing from the delivery means.

19. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (14*a*, 14*b*, 14*c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (16) having a plurality of predefined housings (18) for storing a respective individual reel (12) supporting a respective ribbon-like material,

means (19) for supplying the material to the machine (14*a*, 14*b*, 14*c*),

means (20) for drawing a respective reel (12); and

control means (EE) able to command the gripping of a reel (12), by said drawing means (20), from a predefined housing (18)

and the delivery to said means (19) for delivering the material of a respective work machine (14*a*, 14*b*, 14*c*) and,

vice versa, to command, by said drawing means (20), the gripping of the reel by said means (19) for supplying the ribbon-like material, and the release of said reel (12) to the corresponding housing (18) in said storage bay (16);

wherein said means (20) for drawing a respective reel (12) comprise an organ for gripping the reel (40) having at least first and second mutually parallel tines (42, 44); and

wherein each of said tines (42, 44, 46, 48) has a free end having a portion (50) that projects perpendicularly from the respective tine to retain said reel (12).

20. Apparatus for supplying a ribbon-like material, in particular a fabric, to a plurality of work machines (14*a*, 14*b*, 14*c*) of said material, longitudinally extending parallel to each other, in particular to a plurality of machines for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (16) having a front end and a plurality of predefined housings (18) for storing a respective reel (12) supporting a respective ribbon-like material, said housings (18) extending transversely to the plurality of working machines;

means (19) for supplying the material to a respective machine (14*a*, 14*b*, 14*c*),

means (20) for drawing a respective reel (12); and

control means (EE) able to command the gripping of a reel (12), by said drawing means (20), from a predefined housing (18)

and the delivery to said means (19) for delivering the material of a respective work machine (14*a*, 14*b*, 14*c*) and,

vice versa, to command, by said drawing means (20), the gripping of the reel by said means (19) for supplying the ribbon-like material, and the release of said reel (12) to the corresponding housing (18) in said storage bay (16);

wherein said drawing means (20) comprise at least a movable assembly (45) having means (54) for supporting an organ (40) for gripping the reel; and

wherein said movable assembly is actuated to move along guiding tracks (56, 58) which extend parallel to the drawing front face of said storage bay (16), and transversely to the means for supplying the material to the work machines (14*a*, 14*b*, 14*c*).

21. Apparatus as claimed in claim 20, wherein said support means for the gripping organ (40) are in the form of a movable arm (54).

22. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (14*a*, 14*b*, 14*c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (16) having a plurality of predefined housings (18) for storing a respective reel (12) supporting a respective ribbon-like material,

means (19) for supplying the material to a respective machine (14*a*, 14*b*, 14*c*),

means (20) for drawing a respective reel (12); and

control means (EE) able to command the gripping of a reel (12), by said drawing means (20), from a predefined housing (18)

and the delivery to said means (19) for delivering the material of a respective work machine (14*a*, 14*b*, 14*c*) and,

vice versa, to command, by said drawing means (20), the gripping of the reel by said means (19) for supplying the ribbon-like material, and the release of said reel (12) to the corresponding housing (18) in said storage bay (16);

wherein said drawing means (20) comprise at least a movable assembly (45) having means (54) for supporting an organ (40) for gripping the reel;

said means (20) for drawing a respective reel (12), comprising an organ for gripping the reel (40) and means to impart a rotation, in the two opposite angular direction, to obtain the upsetting of said organ (40) for gripping the reel between a position of drawing from and releasing to the respective housing (18) and in a position of releasing to and drawing from the delivery means (19).

23. Apparatus as claimed in claim 22, wherein said support means for the gripping organ (40) are in the form of a movable arm (54).

24. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (14*a*, 14*b*, 14*c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (16) having a plurality of predefined housings (18) for storing a respective individual reel (12) supporting a respective ribbon-like material,

means (19) for supplying the material to the machine (14*a*, 14*b*, 14*c*),

means (20) for drawing a respective reel (12); and

control means (EE) able to command the gripping of a reel (12), by said drawing means (20), from a predefined housing (18)

and the delivery to said means (19) for delivering the material of a respective work machine (14*a*, 14*b*, 14*c*) and,

vice versa, to command, by said drawing means (20), the gripping of the reel by said means (19) for supplying the ribbon-like material, and the release of said reel (12) to the corresponding housing (18) in said storage bay (16);

wherein said means (19) for supplying the material to the respective machine (14*a*, 14*b*, 14*c*) are means for supporting and unrolling the material from the reel (12) in the form of roller means subdivided into a plurality of sections set transversely side by side (32*a*, 32*b*, 32*c*) so as to define at least a first and a second passage (34, 36) for the insertion of the tines of a fork for drawing the reel (12).

25. Apparatus as claimed in claim 24, wherein each section (32*a*, 32*b*, 32*c*) of said rollers comprises at least a first and a second longitudinally distanced rollers (321, 322),

situated at the same level or height, whereon the reel (**12**) is laid down with its outer surface (**12'**).

26. Apparatus as claimed in claim **25**, wherein each section (**32***a*, **32***b*, **32***c*) of said rollers comprises a third roller (**323**) placed in intermediate longitudinal position relative to said first and second roller (**321**, **322**), and situated at a lower level relative thereto, to define a further bearing point for the substantially cylindrical outer surface (**12'**) of the reel (**12**).

27. Apparatus as claimed in claim **24**, wherein lateral guidance means for the tines of the organ for gripping the reel, when they are introduced into said insertion passages (**34**, **36**), are provided on said means (**19**) for supplying the material to the respective machine (**14***a*, **14***b*, **14***c*).

28. Apparatus as claimed in claim **24**, wherein the rollers (**321**, **322**, **323**) of said roller sections (**32***a*, **32***b*, **32***c*) are supported able to rotate by means of lateral vertical walls (**301**) and intermediate walls (**303**, **304**, **305**, **306**) of said frame (**30**) in such a way that said passages (**34**, **36**) for the tines of the fork are defined between respective intermediate walls (**303**, **304**, **305**, **306**), providing said lateral guidance means for the tines of the reel grip organ which are introduced into said passages (**34**, **36**).

29. Apparatus for supplying a ribbon-like material, in particular a fabric, to at least one work machine (**14***a*, **14***b*, **14***c*) of said material, in particular to at least one machine for cutting the material into predetermined shaped portions,

said apparatus comprising a storage bay (**16**) having a plurality of predefined housings (**18**) for storing a respective individual reel (**12**) supporting a respective ribbon-like material,

means (**19**) for supplying the material to the machine (**14***a*, **14***b*, **14***c*),

means (**20**) for drawing a respective reel (**12**); and

control means (EE) able to command the gripping of a reel (**12**), by said drawing means (**20**), from a predefined housing (**18**)

and the delivery to said means (**19**) for delivering the material of a respective work machine (**14***a*, **14***b*, **14***c*) and,

vice versa, to command, by said drawing means (**20**), the gripping of the reel by said means (**19**) for supplying the ribbon-like material, and the release of said reel (**12**) to the corresponding housing (**18**) in said storage bay (**16**);

wherein the housings (**18**) have a base (**25**) extending horizontally for bearing the reel (**12**) and first and second slits (**26**, **28**) for the insertion of the tines (**42**, **44**) of a fork (**40**) for drawing the reel (**12**).

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